

**Standard:** Students will evaluate the role of natural selection in the development of the theory of evolution.

**Element:** Explain the history of life in terms of biodiversity, ancestry, and rates of evolution.

**EQ:** What can fossils reveal about ancient human ancestors?

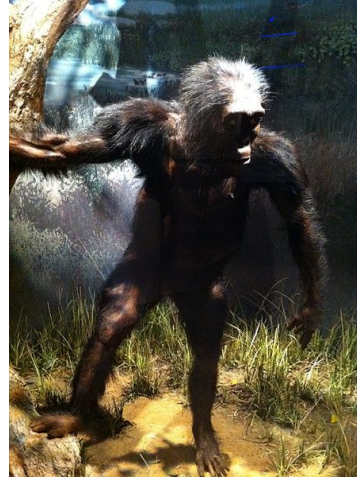
In 1974, a discovery was made in the desert of **Ethiopia**. The bones of an ancient **hominid**, about 40% of the skeleton, provided clues about early **ancestors** of humans.

The scientists named the skeleton "**Lucy**" (the song "Lucy in the Sky with Diamonds" was playing on the radio when it was uncovered).





Scientists estimate that Lucy's skeleton is **3.2 million** years old. At the time, this was the oldest known hominid fossil to have such a **complete skeleton**.



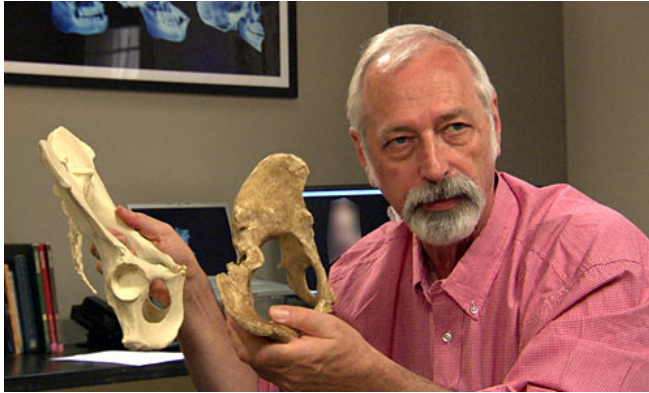
However, in **1994** another important discovery was made. In the same region of Ethiopia, an older, more **complete** skeleton was found, over **110 bones** in all.

This skeleton was named **"Ardi"** and was determined to be **4.4 million** years old.

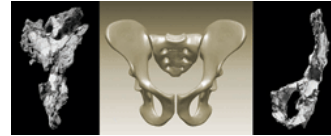


Ardi has some unique features that surprised scientists.

One of the most important discoveries was that Ardi had a **pelvis** that showed she walked upright on **two legs**, like us. Ardi's pelvis showed that she was **bipedal**.

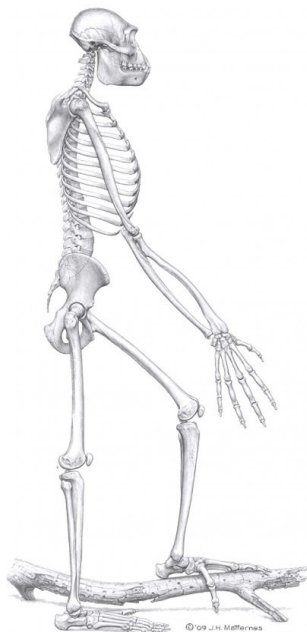


How Ardi walked



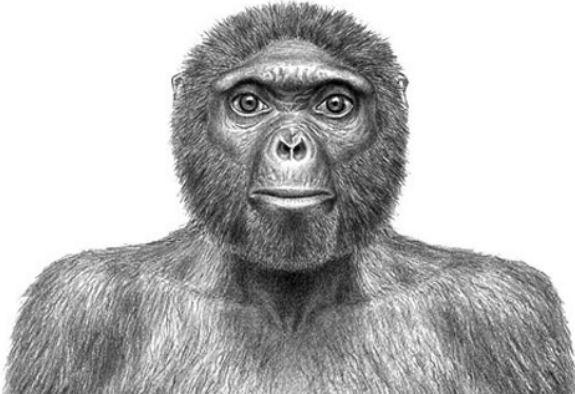
### Ardi's foot

Another interesting discovery was that Ardi had a very different **foot** structure than we do. Ardi's **big toe** was able to grasp objects, like a **thumb**. This is something that we see in **chimpanzees**, but not humans.



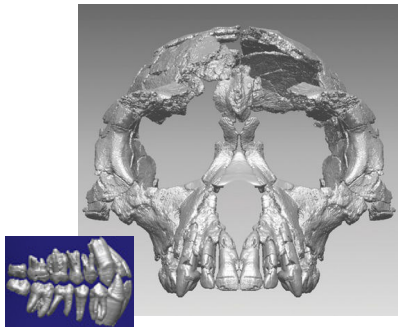
Ardi's **skull** was much more complete than Lucy's, and shows us that Ardi had a **small brain**, like a chimpanzee.

This means that early hominids were **bipedal** before the development of a **large brain**.



Because Ardi's skull was so complete, there are many fossilized **teeth** that give more clues about how Ardi lived.

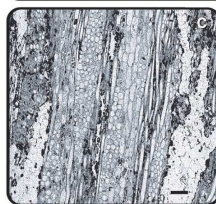
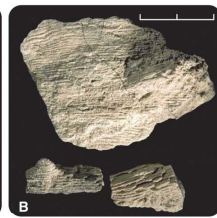
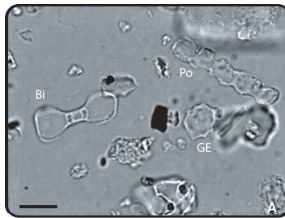
Chimpanzees have large **canine** teeth, especially the **males**, which they use to show aggression when fighting for a **mate**.



Ardi's canines, on the other hand, were much **smaller**, like a **human's**.

Scientists previously thought that bipedality evolved when the **climate** changed and the environment where hominids lived became a **grassland**.

However, fossils found around the Ardi skeleton shows that Ardi, who was bipedal, lived in a **wooded area**.



Fossil evidence for this environment included bones of **tree-dwelling** organisms, as well as fossilized tree **seeds** and **bark**.

Scientific illustrators use their knowledge of **primate** anatomy to hypothesize what Ardi might have looked like.

A common assumption is that an organism this primitive would have been covered in **hair**, more like a **chimpanzee** than a human.

